What is claimed is:

1. A method for manufacturing a glass optical element having at least one concave surface, comprising the steps of:

softening a glass molding material by heating,

molding the softened material with a first mold having a first molding surface and a second mold having a second molding surface by applying a pressure, the first molding surface comprising a first concave surface, the second molding surface comprising a convex surface, planar surface or second concave surface, the second concave surface having a curvature radius greater than that of said first concave surface,

whereby shapes of the first molding surface and the second molding surface are transferred to the material,

cooling the material so that a temperature of the material reaches a temperature equal to or lower than glass transition temperature (Tg), and

removing the cooled material from either of said first mold or said second mold,

wherein in the cooling step, a second temperature of said second mold reaches the glass transition temperature prior to a time when a first temperature of said first mold reaches the glass transition temperature.

2. The method of Claim 1 wherein one of either the first mold or the second mold comprises an upper mold, and the other comprises a lower mold.

3. The method of Claim 2 wherein said first mold comprises an upper mold and said second mold comprises a lower mold.

4. The method of Claim 3 wherein when the second temperature reaches the glass transition temperature, the first temperature is at least 5 degree centigrade higher than the glass transition temperature.

5.　The method of Claim 4 wherein the second temperature reaches the glass transition temperature, the first temperature is 5 degree to 40 degree centigrade higher than the glass transition temperature.

6.　The method of Claim 5 wherein the second temperature reaches the glass transition temperature, the first temperature is 5 degree to 30 degree centigrade higher than the glass transition temperature.

7.　The method of Claim 6 wherein the second temperature reaches the glass transition temperature, the first temperature is 5 degree to 20 degree centigrade higher than the glass transition temperature.

8.　The method of Claim 3 wherein the second temperature of the second mold is lower than the first temperature of the first mold at the end of the molding step.

9.　The method of Claim 8 wherein the second temperature of the second mold is at least 5 degree centigrade lower than the first temperature of the first mold at the end of the molding step.

10. The method of Claim 9 wherein the second temperature of said second mold is 5 to 40 degree centigrade lower than the first temperature of said first mold at the end of the molding step.

11. The method of Claim 10 wherein the second temperature of said second mold is 5 to 30 degree centigrade lower than the first temperature of said first mold at the end of the molding step.

12. The method of Claim 11 wherein the second temperature of said second

mold is 5 to 20 degree centigrade lower than the first temperature of said first mold at the end of the molding step.

13. The method of Claim 8 wherein the second temperature of said second molding surface is lower than the first temperature of said first mold throughout the molding step.

14. The method of Claim 13 wherein the difference between the second temperature and the first temperature becomes gradually smaller in the molding step.

15. The method of Claim 3 wherein following the molding pressure, a secondary pressure smaller than the molding pressure is applied.

16. The method of Claim 3 wherein b/a is at least 1.5 where a is a center thickness of the glass optical element and b is a peripheral thickness of the glass optical element.

17. The method of Claim 3 wherein the second molding surface comprises a second concave surface having a curvature radius greater than that of the first concave surface.

18. The method of Claim 4 wherein the second temperature of said second mold is lower than the first temperature of said first mold throughout the molding step.

19. The method of Claim 7 wherein the second temperature of said second mold is lower than the first temperature of said first mold throughout the molding step.

20. The method of Claim 19 wherein following the molding pressure, a secondary pressure smaller than the molding pressure is applied.

21. The method of Claim 13 wherein the second temperature is kept at least 5 degree centigrade lower than the first temperature at least up to when the second temperature reaches the glass transition temperature.